



CRN

CANCER RESEARCH NETWORK

NEW CONNECTIONS

Big Data:

The CRN covers over 10 million patient members!

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crn.cancer.gov

The Cancer Research Network is an NCI-funded consortium of nine integrated health care systems across the United States. Promoting research collaborations is a primary goal of the CRN.

Collaborative Science in the CRN

In today's rapidly evolving health care environment, the Cancer Research Network (CRN) provides outstanding opportunities to conduct translational cancer research that contributes directly to addressing major questions in cancer prevention, early detection, treatment, and outcomes.

We work with NCI-designated cancer centers, cooperative oncology groups, epidemiology consortia, and other research groups, while fostering meaningful collaborations with our health systems leaders.

Our health care organizations' forward-thinking leadership in creating electronic data systems enabled the creation of our high-quality databases that date back to the mid-1990s. Our research centers have standardized these data by creating a common data model, the Virtual Data Warehouse, which allows health plans to maintain their data locally, respecting privacy concerns, while facilitating participation in collaborative research.

What makes the CRN unique? The defining characteristics of the CRN are researchers embedded in health systems, access to standardized databases capturing clinical and administrative data for millions of members, and the ability to follow defined populations over a long period of time in a community setting. Our close ties to clinical and operations partners facilitate the translation of findings to inform care. The CRN thus brings to life the concept of a learning health care system.

Recent years have seen a burgeoning interest in the promise of Big Data to improve health care. The widespread implementation of electronic health records, and recent initiatives such as the NIH's Big Data to Knowledge program and the Patient-Centered Outcomes Research Institute's Clinical Data Research Networks, point to this interest. The CRN and its parent organizations have presaged this interest and are well-positioned to be a key component of the Big Data cancer-research infrastructure.

This publication provides a snapshot of the CRN's aims and recent achievements. We welcome queries from all potential collaborators and look forward to working with you on cutting-edge research that improves outcomes for cancer patients.

Sincerely, on behalf of the Cancer Research Network,

Lawrence H. Kushi, ScD, Principal Investigator

Heather A. Clancy, MPH, Project Manager

Division of Research, Kaiser Permanente Northern California

V. Paul Doria-Rose, DVM, PhD, Project Scientist,

Division of Cancer Control and Population Sciences, National Cancer Institute

Informatics and Data Resources in the CRN

Because of the integrated nature of clinical systems participating in the CRN and their high member retention rates, researchers have the ability to conduct research through all phases of the cancer care continuum, from primary prevention and risk assessment to active treatment and palliative care.

One of the CRN's greatest strengths is that its research personnel are embedded in health care delivery systems with access to detailed clinical and administrative data. The CRN Informatics Core builds upon this strength by focusing on development and quality assurance of cancer-related data, and on implementation of methods to facilitate multisite, collaborative research. Recent analyses conducted by the Informatics Core demonstrate the CRN's unparalleled ability to conduct longitudinal cancer research in a setting that captures most data related to clinical care.

Member Retention

The Informatics Core examined retention rates for patients with cancer across its nine member institutions. Analysts examined the proportion of patients diagnosed with cancer in 2012 who were continuously enrolled as members of CRN health plans in the years leading up to their cancer diagnosis. Of these patients, more than 90 percent had been members of their health plans for at least 1 year, and more than 50 percent had been continuously enrolled in their health plans for at least 15 years (Table 1).

Table 1: CRN Continuous Enrollment Rate before Cancer Diagnosis, Cancers Diagnosed in 2012, %

	Years before Cancer Diagnosis			
	1+	5+	10+	15+
Continuous Enrollment Rate	91.7	77.5	66.5	54.5

Disenrollment rates

The Informatics Core then examined the disenrollment rate for individuals diagnosed with cancer in 2000. By the end of 2000, 2.7 percent of those individuals were no longer members of their health plans, and at 10 years, the disenrollment rate was 23.4 percent (Table 2). From a research perspective, this continuous enrollment allows the CRN to examine almost complete information on medical care received for more than 75 percent of individuals diagnosed with cancer – even 10 years after diagnosis. Few other settings provide this capability.

Table 2: CRN Disenrollment Rate after Cancer Diagnosis, Cancers Diagnosed in 2000, %

	Years after Cancer Diagnosis					
	0	2	4	6	8	10
Disenrollment Rate	2.7	11.1	16.0	19.1	22.2	23.4

Across the CRN, we are able to study almost complete information on medical care received for over 75 percent of individuals diagnosed with cancer even ten years after diagnosis.

Informatics (cont.)

Quality Assurance

The quality of the CRN’s research is only as good as the data that we use. The CRN Informatics Core periodically conducts quality assurance checks of CRN data. This informs the questions that can be addressed and interpretation of results. For example, we examined the completeness of American Joint Committee on Cancer (AJCC) stage information in our tumor registries. For many cancers, AJCC stage data are available for several sites starting in 2004, when it became a standard variable in the Surveillance Epidemiology and End Results (SEER) Program. Consistent staging criteria can be derived from tumor registry data for several cancers because information on tumor size, nodal status, and presence of metastases is now widely available.

PopMedNet: Preparatory-to-Research Queries

A major accomplishment in the CRN since 2013 was implementation of the distributed query engine, PopMedNet, at almost all CRN sites. PopMedNet allows rapid ascertainment of counts of diagnoses, procedures, and other variables for user-defined enrollment periods. New PopMedNet functionality allows sites to run SAS programs that access individual-level data directly from the CRN’s Virtual Data Warehouse (VDW). This function will soon be rolled out to all CRN sites. PopMedNet facilitates preparatory-to-research queries at user-selected CRN sites, and expedites and simplifies the process for running multisite SAS VDW programs.

See our website for details on how to submit a prep-to-research request: <http://crn.cancer.gov/resources/process.html>

CRN Scientific Working Groups

The objectives of the CRN’s four Scientific Working Groups are to promote innovative, high-quality research in focused areas that can improve our knowledge of cancer.

The CRN’s Scientific Working Groups focus on research across the spectrum of cancer control, and include:

- Prevention & Screening
- Epidemiology of Prognosis & Outcomes
- Health Care Quality & Cost
- Communication & Dissemination



Scientific Working Groups are co-led by scientists with expertise and research interests aligned with their SWG. The leadership team includes investigators at both CRN sites and non-CRN research institutions.

Scientific Working Group activities include:

- Encouraging collaborations among researchers at CRN sites, and with researchers at external institutions;
- Facilitating discussions to promote ideas leading to funded research projects;
- Shepherding research projects to enhance the likelihood of success;
- Encouragement and mentoring of careers in cancer research.

Visit our website for more information on working with our Scientific Working Groups: <http://crn.cancer.gov/collaboration/swgs.html>

The CRN Scholars Program

The CRN Scholars Program aims to help junior investigators become successful independent researchers by using CRN resources to conduct population-based multisite and multidisciplinary studies.

The goal of this 26-month training program is to expand the cadre of investigators committed to conducting population-based cancer research within the integrated health-care delivery systems of the CRN. Scholars come to the CRN from a variety of research settings—academic centers and large health care systems. Some are clinicians while others have advanced training in epidemiology or health services research. The CRN Scholars are a diverse group, and everyone’s unique perspective is valued.

Career transformation

One of the Scholars from our third cohort, Grace Hillyer from Columbia University, exemplifies how this program can transform a research career.

Balancing work and family life, Grace earned an EdD at Columbia University on a part-time basis, while working as a project coordinator on a large multicenter cohort study. Shortly after graduating in 2011, she was promoted to Associate Research Scientist in Epidemiology and has since authored or co-authored 26 papers. In 2014, she became assistant professor in epidemiology at Columbia’s Mailman School of Public Health.

“In winter of 2012, she saw the announcements for the CRN Scholars Program and recognized that it would give her special opportunities, and somehow the review committee had the good sense to recognize the potential in Grace,” said her local mentor, Alfred Neugut, MD, PhD, professor of epidemiology and medicine at Columbia University.

Grace enthusiastically embraced every step of the CRN Scholars program, from participating on the initial conference calls with her mentors, to the weeklong meetings, networking with other scholars, preparing and conducting her own pilot study, and drafting and submitting her first R01 grant proposal to the NIH.

“The training has truly prepared her for the next steps of competing for K and R01 awards,” Neugut continues, “Her progress in research was recognized by our department chair and Grace has just become an assistant professor. She has also just been awarded a large foundation grant. She is off to the academic races — I think the Scholars Program has much to take credit for.”

Recently, after receiving the score on her first R01, in a note to her CRN mentorship team, Grace expressed her gratitude for the skills she has developed as a Scholar and the support provided by the CRN that enabled her to write this grant application. “More importantly,” she said, “I am grateful for the confidence you’ve given me to keep on writing grants.”



Grace Hillyer, EdD, MPH
Columbia University

“The training has truly prepared her for the next steps of competing for K and R01 awards.”
- Alfred Neugut

CRN Scholar Achievements

CRN Scholars participate in activities that help them achieve career goals such as being the first author on a peer-reviewed manuscript and becoming the principal investigator on an R01 or similar grant. The past two cohorts have produced more than 100 first-authored cancer research papers, and have received over 100 cancer-related grants! The third (2013-15) and fourth (2015-17) cohorts will undoubtedly make significant contributions to these numbers. A sample of achievements of the third Scholars cohort include:

Collaborating on multisite projects with senior investigators within and outside the CRN.



"I have developed strong collaborative relationships with multiple researchers across the CRN, creating synergistic relationships and providing the foundation for pursuing larger future grants aimed at establishing a CRN multisite, longitudinal cohort of skin cancer patients." — *Jason Lott, MD, MSHP, Yale University*

Receiving funding for projects including Pilot Funds and K awards.



"A key strength of each of these grant applications was my ability to demonstrate a strong record of mentoring and personal engagement from both CRN and UNC investigators." — *Hazel Nichols, PhD, SM, University of North Carolina*

Participating in in-person mock study sections with personnel from the NIH's Center for Scientific Review.



"The mock review provided insight to the review process, informed the development of my grant proposal and gave me solid feedback to improve upon my ideas and approach." — *Grace Hillyer, EdD, MPH, Columbia University*

Improving knowledge of integrated health care systems and the CRN site data and data resources, including having access to existing project datasets.



"I was able to obtain prep-to-research data and additional data from three individual sites. I collaborated with investigators at these sites to develop and submit a CRN Pilot Project proposal in 2014. These data were also used in the development of an institutional K12 grant application at UMass Medical School." — *Mara Epstein, ScD, University of Massachusetts Medical School*

Our other highly accomplished scholars from the 2013-15 cohort include:



Mateo Banegas, PhD, MPH
National Cancer Institute



Farhood Farjah, MD, MPH
University of Washington



Pamala Pawloski, PharmD
HealthPartners Institute for
Education and Research



Dori Rosenberg, PhD, MPH
Group Health Cooperative



Amit Singal, MD, MS
University of Texas
Southwestern

2015 Scholar Cohort

The CRN is pleased to announce the new cohort of Scholars. They will kick-off the program with an in-person meeting at the 2015 HMORN Conference in Long Beach, California.



Marie Bradley, PhD, MPH, Mpharm

Cancer Prevention Fellow, National Cancer Institute

Project: Testosterone therapy and prostate cancer risk and outcomes



Lisa Carter-Harris, PhD, RN, ANP-C

Postdoctoral Fellow, Indiana University School of Nursing (Indianapolis)

Project: Prevalence of Lung Cancer Screening in High-Risk Smokers



Neetu Chawla, PhD, MPH

Research Scientist, Kaiser Permanente Northern California

Project: Care coordination practices among HER 2+ breast cancer patients in an integrated delivery setting



Kim Danforth, ScD, MPH

Research Scientist, Kaiser Permanente Southern California

Project: Comparative Effectiveness of Bladder Cancer Treatments and Improving Care Quality



Sara Javid, MD

Assistant Professor, Department of Surgery, University of Washington

Project: Development of a Predictive Tool to Estimate Individualized Cancer Recurrence Risk Following Treatment of Ductal Carcinoma in Situ (DCIS)



Elizabeth Kantor, PhD, MPH

Postdoctoral Research Fellow, Harvard School of Public Health

Project: Obesity and Breast Cancer Survival: The Role of Chemotherapy Dosing



Whitney R. Robinson, PhD, MSPH

Assistant Professor of Epidemiology, UNC Gillings School of Global Public Health

Project: Trends in surgical menopause and implications for breast cancer disparities: a pilot study of data from Kaiser Permanente Northern California



Ramzi Salloum, PhD, MA, MBA

Assistant Professor, Department of Health Services Policy and Management, Arnold School of Public Health, University of South Carolina

Project: Measuring individual patient preferences for management of prostate cancer



Ravi N. Sharaf, MD, MS

Assistant Professor of Medicine, North Shore-Long Island Jewish Health System

Project: Identification of a Lynch Syndrome Cohort within the Cancer Research Network



Andy Tan, PhD, MPH, MBA, MBBS

Assistant Professor, Dana-Farber Cancer Institute, Harvard Medical School

Project: Role of Patient-Centered Communication in Improving Adherence to Recommended Intervals of Colonoscopy Surveillance After Polypectomy

Patient Views on Cancer Communication

The CRN aims to improve the quality of care and outcomes of cancer patients, not only through new discoveries and innovative approaches for cancer prevention, early detection, treatment, and management, but also in the dissemination and implementation of new findings. Innovations in care will contribute to improvements in patient outcomes only if they are appropriately communicated and used in practice. Generally, new findings are not adopted into routine practice reliably and rapidly. Gaining a better understanding of the numerous factors that impede or facilitate the adoption of evidence-based practices by health care organizations, professionals, patients and caregivers is a major focus of CRN-based research. The CRN provides a real-world laboratory for studying practice change in a variety of settings.

Effective communication between patients, family members, and cancer care teams is fundamental to patient-centered care. The emotional wallop of a cancer diagnosis, and the difficult, sometimes life-altering decisions and treatments which follow make cancer communication especially important. The CRN recognizes the importance of communication, and encourages research into communication processes, causal mechanisms, and outcomes. The CRN also provides an ideal setting for pragmatic trials of interventions to improve communication between patients, families, and cancer care teams.

One example of work in this area is the development of an adaptive questionnaire designed to elicit patients' views of their communication experiences at key points in the cancer care continuum. Kathleen Mazor, EdD, Meyers Primary Care Institute, has been leading this



Kathleen Mazor, EdD

The CRN also provides an ideal setting for pragmatic trials of interventions to improve communication between patients, families, and cancer care teams.

work, in collaboration with colleagues within and outside the CRN. Building on findings from in-depth interviews with cancer patients and family members about their communication experiences and needs,¹ the team developed a set of questions to assess patients' experiences with diagnosis, decision-making, surgery, chemotherapy, radiation, and transitioning out of active treatment, as well as their overall communication experiences. Results can be fed back to health care systems and individual providers, allowing opportunities to learn from and improve upon patients' experiences. When patients complete the online survey, a feedback report is generated and emailed to the care team.

The adaptive online questionnaire and feedback reports are available at no charge to care teams and providers. Programming for the system has been completed, and dissemination efforts are underway. Full text of the questions can be downloaded from the website, PCCFS.org. Mazor and her colleagues anticipate that the questionnaire and feedback system will be useful for both clinicians and researchers. Inquiries can be directed to Mazor at Kathleen.mazor@umassmed.edu.

1. Mazor, K. M., R. L. Beard, G. L. Alexander, N. K. Arora, C. Firreno, B. Gaglio, S. M. Greene, C. A. Lemay, B. E. Robinson, D. W. Roblin, K. Walsh, R. L. Street, Jr., and T. H. Gallagher. 2013. "Patients' and family members' views on patient-centered communication during cancer care." *Psychooncology* 22 (11):2487-95.

The Cancer Care Continuum

The CRN is an ideal setting to conduct cancer research across the cancer care continuum.



OpenNotes: Engaging Patients to Make Better-Informed Decisions

The OpenNotes Project is a national initiative to create greater transparency in electronic medical records by allowing patients access to the notes written by their health care providers.

Communication and connectivity, core functions of the electronic health record (EHR), are essential to care delivery, shared-decision making, and patient self-management. Whether the goal is prevention through lifestyle change or medication adherence, early detection with cancer screening, or ensuring patient-centered care and satisfaction, the EHR is revolutionizing the practice of medicine.

The OpenNotes project (www.myopenotes.org) is a national initiative that creates greater transparency in electronic medical records by allowing patients access to notes written by their health care providers at their health care visits.



Joann G. Elmore, MD, MPH

Joann G. Elmore, MD, MPH of University of Washington School of Medicine and affiliate investigator at Group Health Research Institute — an internationally recognized expert in cancer screening, medical technology, and medical education — was co-Investigator on the OpenNotes project. Having previously worked with the CRN, and recognizing the potential for additional research collaborations, Elmore returned to the CRN to discuss her work with the OpenNotes project. Her well-received May 2014 webinar to the Prevention & Screening Scientific Working Group highlighted the unique advantages the CRN has for studying the impact of natural experiments on patients, providers, and health care systems.

"Adoption of the OpenNotes approach across the United States was propelled by evidence from a 12-month quasi-experimental trial of 105 primary care physicians and 13,564 patient volunteers," Elmore said. "The study showed that access to notes may improve efficiency and communication, and can activate patients with no more than minimal effect on physicians' work life."^{1,2}

Geisinger Health System, a CRN affiliate site, was one of three health systems that participated in the OpenNotes study. Kaiser Permanente Northwest is now the first Kaiser Permanente region to offer OpenNotes to its patients, with other regions likely to follow.

Elmore's success with the OpenNotes initiative stimulated discussion and interest in future studies that leverage the CRN's ability to improve clinical practice through internal and external research partnerships.

1. Delbanco, T., J. Walker, S. K. Bell, J. D. Darer, J. G. Elmore, N. Farag, H. J. Feldman, R. Mejilla, L. Ngo, J. D. Ralston, S. E. Ross, N. Trivedi, E. Vodicka, and S. G. Leveille. 2012. "Inviting patients to read their doctors' notes: a quasi-experimental study and a look ahead." *Ann Intern Med* 157 (7):461-70.
2. Walker, J., J. D. Darer, J. G. Elmore, and T. Delbanco. 2014. "The road toward fully transparent medical records." *N Engl J Med* 370 (1):6-8.

Preventing Colorectal Cancer Through Improved Screening Methods

A 1992 case-control study of screening sigmoidoscopy and risk of death from colorectal cancer has become the prototypical example of translational research conducted in the CRN setting.¹ This study demonstrated that patients who had died from colorectal cancer were one-third as likely to have had a screening sigmoidoscopy in the prior 10 years as those who did not die (matched by age and sex). Screening rates were 8.8 percent among those who died and 24.2 percent among those who did not. These compelling findings subsequently led to the widespread adoption of sigmoidoscopy or colonoscopy for colorectal cancer screening in Kaiser Permanente, where the study was conducted, and elsewhere.

Although screening is now widely accepted as an effective method for preventing mortality from colorectal cancer, there are still many factors that work against the achievement of optimal screening rates. The National Cancer Institute's exciting new Population-based Research Optimizing Screening through Personalized Regimens (PROSPR) initiative includes a grant focused on colorectal cancer screening. One colorectal cancer center is led by CRN scientists Douglas Corley, MD, PhD, MPH, of Kaiser Permanente Northern California and Virginia Quinn, PhD, MPH of Kaiser Permanente Southern California, former CRN Scholar and Presidential Scholar Chyke Doubeni, MD, FRCS, MPH, of the University of Pennsylvania, and Ann Zauber, PhD, of the Memorial Sloan-Kettering Cancer Center. This project is focused on examining various aspects of the colorectal cancer screening process in Kaiser Permanente Northern and Southern California regions. Another colorectal cancer center, led by Jessica Chubak, PhD, MBHL, is located at the Group Health Research Institute. Additional PROSPR cervical cancer centers were recently established at both of these CRN sites.

In April 2014, Corley and colleagues published a paper focused on adenoma detection rates (ADR) and cancer risk.² The ADR is a measure that indicates the proportion of patients undergoing colonoscopy in which an adenoma, a precursor noncancerous lesion, was detected. They demonstrated that the ADR varies widely among gastroenterologists – from less than 10 percent to greater than 50 percent. Only a small proportion of this variation could be accounted for by differences in the characteristics of patients across providers. They also found that patients undergoing a colonoscopy from gastroenterologists with the highest ADR had half the risk of colorectal cancer incidence, with even greater reductions in colorectal cancer mortality, compared to

patients of gastroenterologists with the lowest ADR.

This example demonstrates the promise and potential of the CRN setting for conducting impactful cancer research. The availability of many years' worth of electronic health records enabled the identification of a large cohort of patients undergoing colonoscopy and who their providers were. The pathology results of these colonoscopies – whether an adenoma was detected, not just whether the procedure had occurred – could also be identified. The high member retention and availability of tumor and mortality data within the VDW made it possible to identify cases and deaths due to colorectal cancer over a 10-year period in these screened patients.

Findings from this research have had a direct translational impact: the goal of improving the ADR among providers in Kaiser Permanente Northern California and throughout the world. Findings from this study led directly to the implementation of semiannual reporting of ADR to all physicians performing these procedures by Kaiser Permanente Northern California's Quality and Outcomes Support group, and to the development and implementation of a mandatory quality-improvement training program, which Corley and colleagues helped to design.



Douglas Corley, MD, PhD,
MPH

Findings from this research have had a direct translational impact: the goal of improving the ADR among providers in Kaiser Permanente Northern California and throughout the world.

1. Selby, J. V., G. D. Friedman, C. P. Quesenberry, Jr., and N. S. Weiss. 1992. "A case-control study of screening sigmoidoscopy and mortality from colorectal cancer." *N Engl J Med* 326 (10):653-7.
2. Corley, D. A., C. D. Jensen, A. R. Marks, W. K. Zhao, J. K. Lee, C. A. Doubeni, A. G. Zauber, J. de Boer, B. H. Fireman, J. E. Schottinger, V. P. Quinn, N. R. Ghai, T. R. Levin, and C. P. Quesenberry. 2014. "Adenoma detection rate and risk of colorectal cancer and death." *N Engl J Med* 370 (14):1298-306.

Natural Language Processing Harnesses Data for Cancer Research

David Carrell, PhD, was awarded CRN Pilot Grant funding in 2013 to pursue his project on the *Development of Natural Language Processing (NLP) Algorithms or Other Mechanisms to Capture Molecular Markers From Tumors*.



David Carrell, PhD

The CRN is an optimal setting for exploring NLP methods to enrich existing data resources.

Electronic medical records (EMRs) offer researchers the opportunity to explore an unprecedented array, volume, and detail of patient medical data. However, within the EMR, there is critical information related to the cancer care experience, such as recurrence, drug allergies, and changes in care plans, which often appear in physician notes and other noncoded or unstructured fields. Researchers are paying increasing attention to the development of strategies for extracting this non-coded information.

Traditionally, noncoded data have required manual extraction by a trained medical record analyst (MRA). While clinical expertise remains a valuable contribution of MRAs, it is time consuming to manually review thousands of records for research. Thus, researchers are exploring more expedient and cost-effective methods of extracting these data. Natural Language Processing (NLP) has the potential to facilitate the extraction of noncoded cancer information from EMRs. NLP refers to the process of training a computer system to recognize, retrieve, and code relevant text.

David Carrell, PhD of the Group Health Research

Institute, is exploring NLP methods for enriching CRN data resources. According to Carrell, who recently received a CRN grant (2013–2014) for his pilot project, *Development of Natural Language Processing (NLP) Algorithms or Other Mechanisms to Capture Molecular Markers from Tumors*, the CRN is an optimal setting for exploring NLP methods to enrich existing data resources, such as the Virtual Data Warehouse (VDW). The VDW facilitates multi-institution projects that may include data from many thousands or tens of thousands of study participants. In such large-scale studies, the ability to incorporate the rich information available in non-coded data expands the range of researchable topics.

In a recently published study, Carrell and CRN colleagues explored the efficiency of NLP for identifying cases of breast cancer recurrence for manual review. They found that the NLP system “correctly identified 92 percent of recurrences and estimated diagnosis dates within 30 days for 88 percent of these. Specificity was 96 percent.”¹ They concluded that the use of NLP for identifying breast cancer recurrence was not only feasible, but that it could make the manual abstraction process more efficient.

The use of NLP also has clinical applications. Carrell is currently working with Elizabeth Trice-Loggers, MD, PhD, an oncologist at the Fred Hutchinson Cancer Center, to examine standards of care for treating patients who have undergone genetic testing. “There are all sorts of information-gathering challenges that would be of interest to clinicians, such as identifying opioid abuse among those on long-term therapy,” Carrell notes. “However, until NLP is built in to electronic medical record systems it will not be available for use in real-time to identify clinical challenges during a physician visit.”

While NLP is unlikely to eliminate the need for manual chart review and has many of its own challenges, Carrell’s work demonstrates the untapped potential for these methods to enhance cancer research.

1. Carrell, D. S., S. Halgrim, D. T. Tran, D. S. Buist, J. Chubak, W. W. Chapman, and G. Savova. 2014. “Using natural language processing to improve efficiency of manual chart abstraction in research: the case of breast cancer recurrence.” *Am J Epidemiol* 179 (6):749-58.

Recent CRN Pilot & Developmental Project Awardees

The CRN funds Pilot & Developmental Projects with the explicit goal that these projects will lead to larger scale fundable research applications. All projects involve population sciences research -- epidemiologic studies or health care services research, broadly defined -- that is conducted within the integrated health care settings of the CRN and affiliate sites.

2013

David Carrell, PhD, Group Health Research Institute
Development of NLP Algorithms or Other Mechanisms to Capture Molecular Markers From Tumors

Jersey Chen, MD, MPH, KP Mid Atlantic States
Left Ventricular Systolic Dysfunction after Trastuzumab Therapy for Breast Cancer

Mara Epstein, ScD, University of Massachusetts Medical School
Are 2 Jars Sufficient for Pathology Examination of Extended Core Prostate Biopsy?

Farhood Farjah, MD, MPH, University of Washington
Automated Tool to Measure Lung Cancer Risk Factors in Pulmonary Nodule Patients

Jennifer Mack, MD, MPH, Dana Farber Cancer Institute
Intensity of End-of-Life Care among Adolescents and Young Adults with Cancer

Maureen O'Keefe-Rosetti, MS, Kaiser Permanente Northwest
Expansion and Updating of the Standardized Relative Resource Use Costing Model

Darren Toh, ScD, Harvard Pilgrim Health Care Institute
Building the capability to conduct population-based research on cancer during pregnancy

Chu-Ling Yu, ScD, MPH, Kaiser Permanente Mid Atlantic States
Establishing a cohort to study cancers in organ transplant recipients

2014

Gabriel Brooks, MD, Dana Farber Cancer Institute
Identifying Patients with Elevated Risk of Chemotherapy-related Hospitalization

Jason Lott, MD, MSHP, Yale University
Utilization and Outcomes of Skin Biopsies for Cutaneous Malignancies

Carmit McMullen, PhD, Kaiser Permanente Northwest
Developing Effective Interventions to Improve Healthcare Provider Endorsement of HPV Vaccination

Hazel Nichols, PhD, SM, UNC Chapel Hill
Identifying a Cohort of Women Who Use Breast Cancer Chemoprevention

Pamala Pawloski, PharmD, HealthPartners Institute for Education and Research
Developing a Model to Predict Neutropenia Risk in Patients with Cancer using the VDW

Dori Rosenberg, PhD, MPH, Group Health Cooperative
Physical activity and sedentary behavior data capture in men with prostate cancer

Ramzi Salloum, PhD, MA, MBA, University of South Carolina
Patterns of Care and Recurrence of Prostate Cancer

Thank you!

The CRN is grateful to the following people for their contributions to the development of this publication: Alyce Adams, Diana Buist, Janet Byron, David Carrell, Jessica Chubak, Heather Clancy, Douglas Corley, Paul Doria-Rose, Joann Elmore, Terry Field, Alyssa Grauman, Bob Greenlee, Grace Hillyer, Stacey Honda, Larry Kushi, Kathleen Mazor, Sarah McDonald, Brian Mittman, Alfred Neugut, Virginia Quinn, and Melissa Williams.



CANCER RESEARCH NETWORK

Come join us!



Lawrence H. Kushi, ScD
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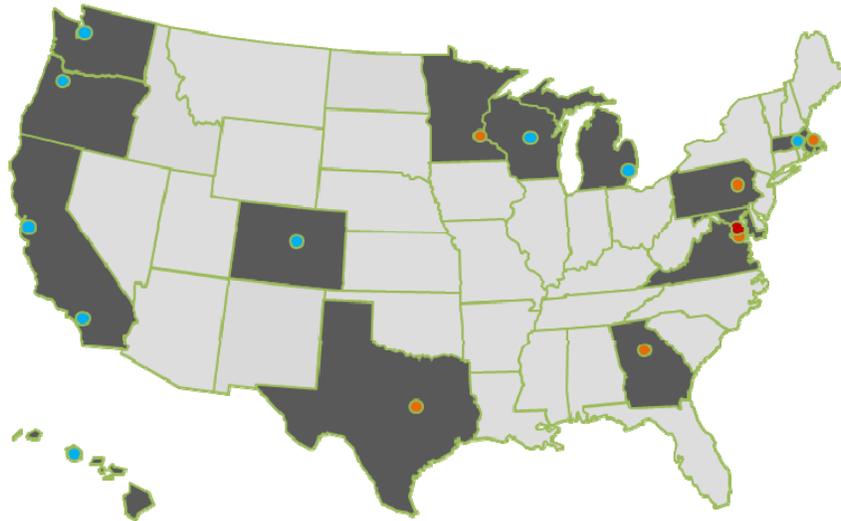
The CRN is continually looking to make new connections and expand our network of cancer researchers interested in conducting population-based research within an integrated health care setting.

See our website for more examples of the work we do, and to submit a research inquiry form.

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Division of Research
2000 Broadway
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CRN Member Sites



**CRN SITES: GROUP HEALTH COOPERATIVE · HENRY FORD HEALTH SYSTEM · KP COLORADO · KP HAWAII · KP NORTHERN CALIFORNIA
KP NORTHWEST · KP SOUTHERN CALIFORNIA · MARSHFIELD CLINIC/SECURITY HEALTH PLAN · MEYERS PRIMARY CARE INSTITUTE**

**AFFILIATE SITES: GEISINGER CENTER FOR HEALTH RESEARCH · HARVARD PILGRIM HEALTH CARE INSTITUTE · HEALTHPARTNERS INSTITUTE
FOR EDUCATION AND RESEARCH · KP MID-ATLANTIC · KP SOUTHEAST · BAYLOR SCOTT & WHITE**

**WITH GRANT SUPPORT FROM THE NATIONAL CANCER INSTITUTE
U24 CA171524**